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10/584,813	06/27/2006	Toshiaki Kawanishi	930055-2045	4947

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Ronald R. Santucci  
Frommer Lawrence & Haug  
745 Fifth Avenue  
New York, NY 10151

EXAMINER
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SAKELARIS, SALLY A

ART UNIT	PAPER NUMBER
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1773

MAIL DATE	DELIVERY MODE
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05/17/2011

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/584,813	<b>Applicant(s)</b> KAWANISHI ET AL.	
	<b>Examiner</b> SALLY A. SAKELARIS	<b>Art Unit</b> 1773	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2011.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10 and 15-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8, 10, 15-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

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## **DETAILED ACTION**

### ***Response to Amendment***

Claims 1-7 have been withdrawn from consideration. Claims 9 and 11-14 have been cancelled. Claims 8, 10, and 15-20 have been amended and remain pending.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 8, 10, 15, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanma et al. ("Capacitance-Type Alcohol Sensor", The Society of Automotive Engineers of Japan, Annual Congress Preliminary Printing Collection 936, 1993-10, pp. 257-260 with English translation) in view of Fleischer et al. (US 5635628).

With regard to claim 8, Sanma et al. teach an alcohol concentration sensor of an electrostatic capacitance type capable of measuring an alcohol concentration in an internal combustion engine fuel mixed with alcohol in Figures 3 and in Figure 10 as can be seen below:

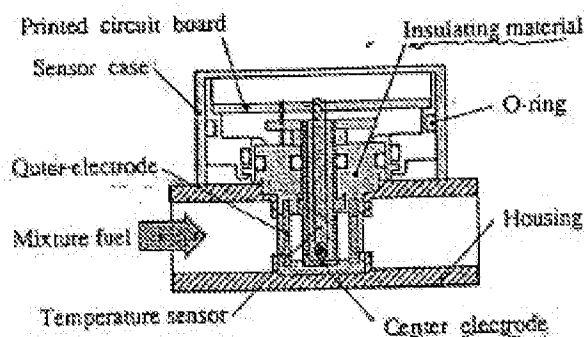


Fig.10 Structure of alcohol sensor

Sanma et al. teach that the sensor comprises: an insulating substrate and a pair of electrodes (Center and Outer) arranged on a surface of the insulating substrate capable of producing an electrostatic capacitance, wherein the insulating substrate is made of a material showing a low dielectric constant (i.e., discussion on pages 3 and 9 of their translation) in their taught insulating resin mold, substrate. Sanma et al. further teach a pair of lead out electrodes (i.e., leading out from the center and outer electrodes) that are exposed by the resin mold and

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configured such that they are capable of being brought into contact with the internal combustion engine fuel mixed with alcohol (see fuel mixture proximity in Figure 10 above).

With regard to claim 8, Sanma does not teach that the substrate has a thickness between 200 and 1000um, has a dielectric constant not higher than 5, that the pair of electrodes is at least partly covered by an insulated protective film showing a specific dielectric constant not higher than 5 or having a thickness between 0.4um and 1um.

With regard to claim 8, Fleischer et al. teach a method and sensor for detecting methane within a gas mixture. Fleischer et al. teach an insulating substrate made of a material with a dielectric constant not higher than 5 in their teaching of silicon, electrically insulating substrate that is about 0.5um thick.

Fleischer does not teach a substrate that has a thickness between 200 and 1000um.

Since the instant specification is silent to unexpected results, it would have been obvious to one of ordinary skill in the art to change the thickness of the substrate, since such a modification would have involved a mere **change in the size (or dimension) of a component.**

A change in size (dimension) is generally recognized as being within the level of ordinary skill in the art. In re Rose, 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device, Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984). It is well known in the art that the value of the electronic capacitor is dependent upon the area of the plates, the distance between them and the dielectric constant of

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the material or dielectric between them. The greater the area of the plates, the closer they are together and the greater the value of the dielectric constant the greater the value of capacitance. The thickness of the substrate in addition to these various design parameters are taken into consideration when determining the most optimal construction for the device.

With regard to claims 8 and 20, Fleischer teach that the pair of electrodes are at least partly covered by an insulated protective film consisting of SiO<sub>2</sub> (Col. 3 lines 7-20 and lines 33-40), which is well known in the art to have a dielectric constant not higher than 5 and is taught to have a thickness of about 1 to 50um (Col. 3 line 27).

It would have been obvious to a person of skill in the art at the time the invention was made to have used the protecting film of SiO<sub>2</sub> of Fleischer within the device of Sanma as SiO<sub>2</sub> is well known to have a small leakage current, high breakdown voltage, and high reliability.

With regard to claims 10 and 19, Sanma do not teach that their electrodes are between 0.01 and 0.8  $\mu\text{m}$  or are of the thin film variety.

Fleischer et al. teach that their electrodes can come in various sizes dependent on the optimization of the apparatus of a whole but specifically asserted that they can comprise thicknesses from about 0.1  $\mu\text{m}$  to about 10um (Col. 2 lines 63-65).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to have used the thin film electrodes at the thickness taught by Fleischer within the sensor of Sanma et al. as the introduction of thin film electrodes confers benefits of lower volume, weight, cost, and higher application temperature to the apparatus.

With regard to claim 15, Sanma et al. teach an oscillation circuit (Pg. 4 of translation) including a pair of electrodes and a processing section (i.e., comparator) capable of

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computationally determining the alcohol concentration according to an oscillation frequency of the oscillation circuit via the schematic shown in Figure 1 and via comparator (Figure 3 block diagram circuit and graphs 2, 3, 5-9 and page 5 lines 15-19).

With regard to claim 18, Sanma et al. teach that the apparatus determines the concentration of alcohols within gasoline (Abstract).

2. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanma et al. ("Capacitance-Type Alcohol Sensor", The Society of Automotive Engineers of Japan, Annual Congress Preliminary Printing Collection 936, 1993-10, pp. 257-260 with English translation) in view of Fleischer et al. (US 5635628) and in further view of Stanbro et al. (US 4728882).

With regard to claims 16 and 17, and in view of the claim interpretation section above, Sanma et al. teach a processing station in the form of a comparator and various different computational outputs that are shown in Figures 1-9.

Neither Sanma or Fleischer teach the processor as claimed.

With regard to claim 16, Stanbro et al. teach a processing section that computationally determines the alcohol concentration using a calibration curve in their microprocessor system of Figure 9. The output frequency of each oscillator (62,64) is fed to an associated counter (66,68) which sends the frequency count in digital form via bus 70 to microprocessor 72. A look up table containing data similar to that shown in Fig.2, is stored in the microcomputer and a determination of the concentration of the analyte in the fluid medium is made (Col. 9 lines 40-59).

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With regard to claim 17, Stanbro et al. teach the look up table within the microprocessor includes a relationship that corresponds to the alcohol concentration and the oscillation circuit, namely the determination of the concentration of the analyte in the fluid medium is made (Col. 9 line 50-55) within the range of 0-5% accuracy.

It would have been obvious at the time the invention was made to have used the microprocessor system of Stanbro et al. in the device of Sanma in view of Fleischer as computers are well known in the art and programming them to perform the functions and analysis taught by Sanma would provide a cost and time savings via the incorporation of automating steps such as are claimed.

### ***Response to Arguments***

Applicant's arguments filed 4/1/2011 have been fully considered but they are not persuasive.

Applicant first argues that "the office action fails to address the recitation in the claims of wherein the connection ends of the lead-out electrodes and a part of the insulating substrate are sealed by the resin mold forming a resin-sealed body". However, as this recitation is presently written, the structural requirements of the claims are maintained as being taught within, for example, Figure 10 that shows both electrodes and an end that is connected and a part of the insulating substrate is sealed by the resin mold forming insulating substrate, sensor case and housing.

Applicant next argues that "one of ordinary skill in the art would not consider a coaxial electrode unit to be a pair of electrodes" and that "the reference is silent on the electrodes arranged on a surface of the insulating substrate as required". These arguments are not



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convincing as the only limitation recited in the claim is that minimally, a pair of electrodes is required. A pair of electrodes, i.e., 2 electrodes of any type, are taught by Sanma et al.

Furthermore, the minimal requirement of electrodes arranged on ANY surface of the insulating substrate is taught by Figure 10. The applicant is encouraged to add positively recited structural limitations to their claims that distinguish the structure of their electrodes, insulating substrate, and collective pieces of their sensor with that in the prior art.

Applicant next argues that Sanma does not teach a dielectric constant not higher than 5. The applicant is correct as can be seen in the 103 rejection of record. Fleischer et al. is relied upon for the teaching of the dielectric constant not higher than 5.

Applicant next argues about the applicability of the Fleischer reference, as it is directed to gas sensors. However, these arguments are not convincing since the Fleischer reference was only relied upon for its teachings of the substrate has a thickness between 200 and 1000um, has a dielectric constant not higher than 5, that the pair of electrodes is at least partly covered by an insulated protective film showing a specific dielectric constant not higher than 5 or having a thickness between 0.4um and 1um. The obviousness of the combination is maintained and can be seen in detail above. The applicant is encouraged to add additional positive recitations of the structure of their device. The examiner encourages the applicant to phone them should they desire their additional input on potential claim amendments in an attempt to provide the most compact prosecution possible.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SALLY A. SAKELARIS whose telephone number is (571)272-6297. The examiner can normally be reached on Monday-Friday 8-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 5712721267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sally A Sakelaris/

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